CHAPTER XI

AGRICULTURAL REGIONS AND LAND USE
STUDY OF SAMPLE VILLAGES

The delimitation of crop combination region is an important criterion for agricultural region, but the crop patterns would not by themselves form the basis of agricultural regions. Agricultural regions would have to be defined in rather more comprehensive terms.

In this context, it may be useful to present here the methods used by different geographers. Two points need to be decided viz., (i) the criteria to be used and the factors to be considered and (ii) the nomenclature to be adopted.

The criteria to be considered will naturally depend upon the size of the area in question, the areal distribution of environmental conditions and the distribution of human conditions. For instance, when areas of continental or sub-continental dimensions are considered, climate becomes the most important environmental factor. In other cases, topography, soils or vegetations may be more important while still in other cases, the crops grown or the techniques of cultivation may be important.

In a series of articles in 'Economic Geography', different geographers divided the various continents into agricultural regions. Prof. Baker, in describing the agricultural regions of North America, defines an agricultural region as "an area of land characterized by homogeneity of agricultural conditions, especially crops grown, and sufficient dissimilarity form conditions in adjacent territory as to be clearly recognizable".¹ The regions recognized

by Baker are primarily determined by climate, particularly temperature (in the eastern part) and rainfall (in the western part); and are named after the principal crops, e.g., the cotton Belt, the Corn Belt etc.

Climate again forms the main basis of the agricultural regions of Europe described by Jonasson who identifies the main zones with certain characteristic crops, for example, the temperature or Small Grain Zones, the Sub-Tropical or Mediterranean Fruit Zone etc. The author (Jonasson) has also considered the characteristic land utilization patterns like crop-pasture land etc. It is obvious that when areas of continental dimensions are considered, climate is the main basis of division, producing certain characteristic crops (or crop combinations).

When a smaller area is to be considered, topography and geology become more important than climate which may be uniform or nearly so over the whole area. For instance, in discussing the agricultural regions of Guatemala (about five times the size of Central Gujarat), Higbee has used the contour line, so that the map of agricultural regions is the same as a relief map. This is because "changes in altitude and, thus, in temperature are the prime determinants of crop provinces." The agricultural regions of Germany as recognized by Niehaus are also mainly based on topography and are named as 'Lowlands', 'rolling land'

foothills and mountain ranges etc. Stamp and Beaver have also divided England and Wales into agricultural regions based on relief. There are two broad zones: the Highland Zone and the Lowlands Zone and these are subdivided into such regions as 'The Pennines', The Plain of Lansastria', The Vale of York etc., based evidently on relief.

Two Distinct Regions:

Within the area under investigation, covering approximately 17,000 sq. kms., there is not a very marked differentiation of climate, so that this factor cannot be profitably used in demarcating the boundaries of the agricultural regions. Topography and Soils, however, show a well-marked areal variation and these have, therefore, been largely used as the factors for the demarcation of agricultural regions. Very broadly, one can see that the Eastern Hilly Tract, covering the Eastern Panchmahals district and northeastern part of the Chhota Udepur taluka of the Baroda district forms an agricultural region, different from the rest of the Panchmahals and Baroda districts. Within the Eastern Hilly Tract, however, there are important differences on account of soils. In the Khan river valley accumulation of fertile, medium black, sticky soils has naturally led to the cultivation of rice and gram and to more improved systems of

agriculture; whereas, in the areas with rugged slopes, with only reddish brown stony soils, maize has become the most important crop, kharif cultivation is more important and the methods of cultivation are poor. Thus, within the Eastern Hilly Tract one agricultural region could be recognized which has more or less the same fertility of soils and within this agricultural region, smaller units could again be recognized, based on purely local differences of slopes and soils. Very often, the fact whether the village is a Hil village or is occupied by Kolis or others, is a deciding factor in causing local differences. In an area with abundant variations in relief, slope and soils, even adjacent villages may differ from each other in agricultural techniques, crops, grown and population density.

The northeastern hilly area which is double cropped may be designated as the 'Double-Cropped Irrigated Region' and the remaining portion of Central Gujarat can be divided into four agricultural regions, which have several local variation, based on the availability or otherwise of irrigation. In many places, cash crops like cotton, groundnut and tobacco are much more important. In some areas the farmers are of the progressive type and they take special care of their fields and use latest techniques, fertilizers and medicines for the crops. Some regions are much more uniform in their surface features than the other agricultural regions.

Fig. 33 shows the Agricultural Regions and Sub-Regions which are as follows:
I- The Padra Kanham
II- The Double-Cropped Irrigated Region:
   (a) The Rice-Maize Sub-Region
   (b) The Maize-Gram-Rice Sub-Region
CENTRAL GUJARAT
AGRICULTURAL REGIONS

SOURCE:
AUTHOR'S COMPUTATION OF UNPUBLISHED TALUKAWISE
AGRICULTURAL STATISTICS OBTAINED FROM THE DISTRICT
INSPECTOR OF LAND RECORDS, BARODA AND PANCHMAHALS.

Fig. 33
III- The Baroda Savli

IV- The 'Medium Black' Soil Tract
   (a) The Northern Rice Maize Groundnut Sub-Region
   (b) The Southern Cotton-Rice-Jowar Sub-Region
   (c) The Eastern Rice-Groundnut -Cotton Sub-Region

V- The Halol Godhra Plain

The writer in the first instance has made an attempt to study the
detailed characteristics of each of the above mentioned region and
sub-region. From each region and sub-region representative villages
were selected for a detailed study of their soils, land use patterns
in the kharif as well as in the rabi seasons.

In the study of the villages, the author first obtained the village
outline map from the Talathi (village accountant) and recorded the
use of every parcel of land, by field observation, both in the kharif
and the rabi seasons. The statistics relating to land-use in the two
seasons are therefore entirely based on the writer's field work.

I- THE PADRA KANHAM

True Kanham conditions are deep black clayey soil with cotton as
the main crop. This exists mainly in the Karjan and sinor Talukas. From
here the system of cultivation has spread elsewhere so that one might
say that the whole of the Karjan, Sinor , the southwestern Dabhoi
talukas of the Baroda district generally have Kanham conditions. Eastern
Padra taluka is Kanham while westwards the soils become Godhra (sandy loam) and coastal sandy alluvium. The conditions become more and more 'non-Kanham', as one proceeds northeastwards. The Central Dabhoi taluka is transitional.

Relief Features:

The Kanham area represents the lowland of the Narmada-Dhadhar, covered by the alluvium of these two rivers. This lowland is very gentle and has slopes towards the west. Northwestwards lies the Gulf of Cambay in which the Mahi empties her water, while southwards and southeastwards lie the Broach cotton tract. On the east and north the Kanham is bounded by the Heran-Orsang plain and Achhali ridge, beyond which is the narrow valley of the Dhadhar, while to the north, there is a flat plain.

The general elevation of the Kanham is about 30 metres above sea-level. The Kanham is drained by the Narmada, Dhadhar and its various tributaries, like the Rangai and the Vishwamitri. The Kanham is not only level and uniform in its surface features but is also largely non-forested. A traveller along the Bombay-Baroda road, for instance, would not see forests and hills as far as his eyes can see.

Except for the narrow zone of the Mahi mouth the entire Kanham is covered with deep black clay. These sticky, clayey soils are chiefly responsible for the prevailing agricultural conditions. Such soils yield a good crop of cotton in a cotton growing village in Karjan taluka.
Distribution of crops:

The Kanham is the most widely cultivated area in the sense that a very large proportion of the area is under crops. Secondly, the crops are chiefly grown in the kharif season. The following figures for certain talukas will exemplify these statements:

**TABLE LXV**

<table>
<thead>
<tr>
<th>Taluka</th>
<th>Percentage of net sown area to total area</th>
<th>Percentage of net sown area Kharif season crops</th>
<th>Rabi season crops</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Cotton</td>
<td>Rice</td>
</tr>
<tr>
<td>Karjan</td>
<td>86.40</td>
<td>67.62</td>
<td>3.17</td>
</tr>
<tr>
<td>Sinor</td>
<td>80.02</td>
<td>60.93</td>
<td>6.07</td>
</tr>
<tr>
<td>Dabhoi</td>
<td>82.28</td>
<td>58.44</td>
<td>10.17</td>
</tr>
<tr>
<td>Padra</td>
<td>76.34</td>
<td>41.03</td>
<td>9.02</td>
</tr>
</tbody>
</table>

Among the crops, cotton and rice (both kharif) are the most important. The percentage of net sown area occupied by these two crops together is 70.79 for Karjan, 68.61 for Dabhoi, 67.0 for Sinor and 50.05 for Padra. Locally in many villages, the most important crop is cotton and other crops of lesser importance are kodra, bajri, tur (arhar) etc. In rabi season jowar, wheat, castor etc., are grown in certain fields. In the Kanham village, the rabi crop is about 1/8 of the kharif crop. In the Kanham there are villages where tur (arhar) is also grown with rice.
In non-kanham villages, located in the western part of the Padra taluka, the soil becomes lighter (slightly goradu) and vegetables become more important. In such riparian villages tur assumes some importance, being often grown in combination with rice or kodra. For example, in the village Mujpur, rice and tur mixture occupy 42.63 per cent of the net sown area.

A small percentage of the area lying on the border of the Kanham (villages of Padra and Dabhoi talukas) are double-cropped, because the soil pattern changes from deep black clay to gorat and goradu and also because some irrigation facilities are available.

A small percentage of the net sown area is irrigated from wells, tanks and canals. There is, however, an important irrigation project which needs special mention. This is the Jojwa-Wadjwan tank and canal scheme which was taken up in the year 1909-10 and completed in 1927 at a cost of Rs. 11,56,494. The tank is designed to irrigate 5,000 acres of kharif, 700 acres of rabi and 100 acres of fodder crop areas.

The representative village for the region (Padra Kanham) for intensive study is Navi Jithardi.

**VILLAGE NAVI JITHARDI**

This small village situated about 4 km. south-east of Miyagam railway station (Fig.34) has all the characteristics, typical of a Kanham region.

1. Courtesy: The Executive Engineer, Irrigation Division, Baroda. (1964)
LOCATION OF THE VILLAGE NAVI, JITHARDI

SOURCE:
SURVEY OF INDIA MAP No 46 E
THE OUTLINE OF NAVI JITHARDI HAS BEEN DRAWN BY THE WRITER

Fig. 34
An attempt has been made in Fig. 35 to classify the village fields according to their fertility and productivity. The major proportion of the village land has deep black clayey soil 'A', ideally suited for cotton cultivation. This soil needs no irrigation because of its high moisture retaining capacity. The land is cropped in the kharif and can also be utilized for the rabi season.

'B' the medium quality land covers a small area. The soil is medium black clay which is also not irrigated. Portions of this land are used for grazing and cultivation of groundnut. 'C' is the poor quality land and which remains unutilized and the area is observed as a grazing land and cemetery of the village.

**Land Utilization:**

The land-use of the village Navi Jithardi in 1961-62 is shown in Fig. 36. The mapping of the land use is based on the writer's field work in the village.

Table LXVI gives a summary of the proportions of the village land devoted to various uses.
NAVI JITHARDI
LAND CLASSIFICATION

Yards 200 0 200 400 600 800 1000 Yards
250 0 500 1000 Metres

A - GOOD QUALITY LAND
B - MEDIUM QUALITY LAND
C - POOR QUALITY LAND
S - SETTLEMENTS
--- - ROAD (UNMETALLED)
^--- - CART TRACK
^   - CEMETERY
   - WELL
T   - TANK

SOURCE: BASED ON AUTHOR'S FIELD WORK.

Fig. 35
<table>
<thead>
<tr>
<th>Use of land</th>
<th>Area in acres</th>
<th>Percentage of the total area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Sown Area</td>
<td>614.1</td>
<td>89.47</td>
</tr>
<tr>
<td>Fallow Land</td>
<td>...</td>
<td></td>
</tr>
<tr>
<td>Forest</td>
<td>...</td>
<td></td>
</tr>
<tr>
<td>Land not available for cultivation</td>
<td>30.9</td>
<td>4.97</td>
</tr>
<tr>
<td>Other uncultivated land</td>
<td>38.8</td>
<td>5.56</td>
</tr>
<tr>
<td>Irrigated Area</td>
<td>...</td>
<td></td>
</tr>
<tr>
<td>Total Kharif area</td>
<td>614.1</td>
<td></td>
</tr>
<tr>
<td>Total Rabi area</td>
<td>45.5</td>
<td>or about 1/13 of the Kharif area</td>
</tr>
</tbody>
</table>

It is seen that the village has a very high percentage of cultivated land. This speaks of the high degree of fertility of the land. On the other hand, no land is kept fallow. Unlike many parts of the Baroda district, there is no need to leave land fallow or give them a period of rest. The land is cultivated continuously year after year. Similarly, only a small part of the land is "not available for cultivation". This consists mostly of

* obtained from the Talathi (Village accountant) at Navi Jithardi.
areas occupied by houses, roads, tanks etc., and certain portions which are utilized as the village grazing land.

The percentage of the rabi area is insignificant as compared with the kharif area.

The use of land in the kharif and rabi seasons of 1961-62 is shown in Fig. 36. The area occupied by each crop in these seasons is shown in Table LXVII.

**TABLE LXVII**

<table>
<thead>
<tr>
<th>Crops</th>
<th>Area in acres</th>
<th>Percentage of net sown area</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Kharif crops</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cotton</td>
<td>549.1</td>
<td>89.40</td>
</tr>
<tr>
<td>Fodder</td>
<td>24.9</td>
<td>4.05</td>
</tr>
<tr>
<td>Rice</td>
<td>18.6</td>
<td>2.93</td>
</tr>
<tr>
<td>Tur (arhar)</td>
<td>11.9</td>
<td>1.99</td>
</tr>
<tr>
<td>Groundnut</td>
<td>9.6</td>
<td>1.63</td>
</tr>
<tr>
<td><strong>Rabi crops</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jowar</td>
<td>38.2</td>
<td>6.19</td>
</tr>
<tr>
<td>Wheat</td>
<td>5.1</td>
<td>0.31</td>
</tr>
<tr>
<td>Castor</td>
<td>2.2</td>
<td>0.32</td>
</tr>
</tbody>
</table>
NAVI JITHARDI
LAND UTILIZATION
KHARIF & RABI SEASONS
1961-1962

KHARIF CROPS
- RICE
- COTTON
- GROUNDNUT
- SUNDHIA
- FODDER
- GRASS
- TUR (ARHAR)

RABI CROPS
- JOWAR
- WHEAT
- CASTOR

LAND NOT AVAILABLE FOR CULTIVATION:
- WASTE LAND
- SETTLEMENTS
- VILLAGE ROAD & CART TRACK
- WELL
- TANK

OTHER UNCULTIVATED LAND:
- GRAZING LAND
- CEMETERY
- VILLAGE COMMON

Total Area (693.6 Acres)
Source: Based on Author's Field Work.

Fig. 38
Cotton which is the cash crop of the area is most important. The rabi crops of Jowar, Wheat and Castor are insignificant. Wheat is grown singly, while castor is usually cultivated as a mixed crop.

With a population of 282, living in 45 houses, Navi Jithardi is thus a typical Kanhaia village. The people sell their produce at Karjan (Miyagam), which is one of the biggest villages of the Baroda district and is really semi-urban and also the headquarters of the taluka.

Crop Patterns

The cropping pattern of the village is simple. The cotton fields are usually much larger than the rice and jowar fields. Here and there, are patches of fields growing Jowar, wheat Castor. It is only in areas close to the village site that paddy is grown in small fields where the farmers can pay more attention. Some of the cotton fields are, double cropped. The map therefore, conspicuously shows cross-shading which indicated double cropping.

II DOUBLE-CROPPED IRRIGATED REGION

This region covers the northeastern half of the Panchmahals district. While the Kanham to the southwest is drained by the Narmada and the Dhadhar (Gulf of Cambay drainage), the northern half is washed by the Anas and the Hadaph which are Mahi streams. As compared to the Kanham the latter is hardly uniform in its surface features. To the southeast
lies the Ratnamal Plateau with much undulating land while in the
central part rises the Dohad Range. The land generally slopes to the
northeast. Dohad railway station is 425 metres above sea-level while at
a distance of about 12 kms., in the same direction, Anas railway station
is 360 metres above M.S.L. The deep black clayey soils of the Kanham are
replaced here by medium black clay, shallow, sandy and coarse sandy soils.
This accounts for the Kanham being essentially a cotton-producing tract,
while the Dohad, Jhalod tract is relatively more important for maize.
The rabi' crops are however, quite significant which are cultivated
with the help of irrigation.

Irrigation:

It must first be mentioned that irrigation is done mostly from wells,
tanks and canals. In the whole of the Panchmahals district there are
3,865 wells (masonry and non-masonry), 9 major and 19 minor tanks and
39 canals with a total length of about 130 km. Most of the tanks are located
in this region. The construction of tanks is facilitated by the prevailing topography, where a natural depression or valley may be bunded on the
lower side and water stored.

The largest project in this region is the Muwana tank located
5 km. from Dohad in the Dohad taluka. The Parthampur tank, located 4 km.
east of Limdi, has canals which irrigate about 2,000 acres of land in
Jhalod taluka. Other principal tanks are the Gamri tank, the Garbara
and the Ambti tanks. Several new tanks have been taken up for construction
under the Fourth Five Year Plan.
This region has, therefore, the largest irrigated area in Central Gujarat. Of the total area of 60,343.8 acres in two districts, the Double-Cropped Irrigated Region (comprising essentially the whole of the Santrampur, Jalod, Dohad and Limkheda talukas of the Panchmahals district) has 15,453.4 acres.

The percentage of irrigated area to net sown area and the percentage of double-cropped area to net sown area for the talukas of this region are as follows:

<table>
<thead>
<tr>
<th>Taluka</th>
<th>Percentage of irrigated area to net sown area</th>
<th>Percentage of double-cropped area to net sown area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Santrampur</td>
<td>1.63</td>
<td>5.70</td>
</tr>
<tr>
<td>Jalod</td>
<td>8.01</td>
<td>9.90</td>
</tr>
<tr>
<td>Dohad</td>
<td>1.04</td>
<td>7.16</td>
</tr>
<tr>
<td>Limkheda</td>
<td>2.10</td>
<td>2.97</td>
</tr>
</tbody>
</table>

It must be noticed that double cropping is only due to the irrigation facilities.
Distribution of Crops:

In the double-cropped irrigated region, the two principal crops are maize and gram. Figs. 22 and 31-A show that almost all the talukas of this region rank 'High' or 'Very High' in both these crops. The reason for this is obvious. The prevailing soils of this area are the best maize soils in the district. It is natural, therefore, that maize should be dominant kharif crop. On the other hand, the availability of irrigation enables the farmers to raise a second crop in winter. In the light soils of this area, gram is preferred to wheat. Gram is therefore one of the most important rabi crops. Of the total area under maize and gram in the entire Central Gujarat (4,66,006 acres) the four talukas of this Agricultural Region account for 3,00,793.6 acres or nearly 64.54 per cent. In individual villages, maize and gram may become the most important crops.

Apart from maize and gram, the other chief crops include rice and groundnut in the rainy season and wheat and blackgram in winter. In Santrampur taluka, paddy is an important kharif crop. Bajri, cotton, kodra, and tur are hardly grown.

Sub-Regions:

Throughout this 'Double Cropped Irrigated Region' a variety of local conditions may be noticed, the variety being due to the prevailing conditions of geology, topography, and soils. The two crop combinations are;
viz. (i) The Rice-Maize Sub-Region, exemplified by Santrampur taluka. Even within this sub-region, rice is more important in the portion covered by the Aravallis. (ii) In the high lying areas the importance of maize and gram increases and hence the 'Maize-Gram-Rice Sub-Region'.

The author has selected a representative village from each of the two sub-regions of the 'Double-Cropped-Irrigated Region' for intensive study. Kalian village represents the Rice-Maize Sub-region, while Andhari village represents the Maize-Gram-Rice Sub-Region.

**VILLAGE KALIAN**

This village, situated about 10 km. northwest of Jhalod (Fig.37), has been selected not only because it is typical of the agricultural Sub-Region to which it belongs, but also because of the extent of development work done there. This village is very prosperous, mainly because of the availability of irrigation facilities.

An attempt has been made in Fig.38 to classify the village fields according to their fertility and productivity. The soil is mainly sandy.

The soil of the good quality land 'A' is coarse sandy soil (brown in colour) and is irrigated from wells. The soil is suitable for kharif and rabi crops. The soil of the medium quality land 'B' is sandy loam is less productive. The poor quality lands are 'G' which produce kuri, bavto, samel, and such other inferior quality of cereals.
VILLAGE STUDIES—II

LOCATION OF THE VILLAGE KALIAN

SOURCE
SURVEY OF INDIA MAP NO. 46

THE OUTLINE OF KALIAN HAS BEEN DRAWN BY THE WRITER
Irrigation:

An attempt has been made in Fig. 39 to demarcate the irrigated land on the basis of information obtained by the writer during his visit to the village in the kharif and rabi seasons of 1961-62.

Land Utilization:

Table LXIX shows the use of land in the village in 1961-62.

<table>
<thead>
<tr>
<th>Use of land</th>
<th>Area in acres</th>
<th>Percentage of the total area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net sown area</td>
<td>528.6</td>
<td>80.10</td>
</tr>
<tr>
<td>Fallow land</td>
<td>25.7</td>
<td>3.81</td>
</tr>
<tr>
<td>Forest</td>
<td>66.5</td>
<td>10.06</td>
</tr>
<tr>
<td>Land not available for cultivation</td>
<td>39.0</td>
<td>5.95</td>
</tr>
<tr>
<td>Other uncultivated land</td>
<td>0.5</td>
<td>0.08</td>
</tr>
<tr>
<td>Double cropped land</td>
<td>254.9</td>
<td>48.20 of N.S.A.</td>
</tr>
<tr>
<td>Total kharif area</td>
<td>528.6</td>
<td></td>
</tr>
<tr>
<td>Total rabi area</td>
<td>254.9</td>
<td></td>
</tr>
</tbody>
</table>
KALIAN
IRRIGATION
1961-1962

SOURCE:
BASED ON AUTHOR'S FIELD WORK.
The following points may be noted:

(i) The high percentage of double-cropped land which is the most important characteristic of this agricultural region. This is made possible by the availability of irrigation, done by wells.

(ii) There is a predominance of kharif crops but rabi crops are also equally important, therefore, the farmers are busy nearly throughout the year.

(iii) The insignificance of fallowland and 'other uncultivated land' may also be noticed.

The table LXX gives a summary of the proportions of the village lands devoted to various crops.

<table>
<thead>
<tr>
<th>Crops</th>
<th>Area in acres</th>
<th>Percentage of net sown area</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Kharif Crops:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rice</td>
<td>208.0</td>
<td>38.95</td>
</tr>
<tr>
<td>Maize</td>
<td>193.5</td>
<td>36.50</td>
</tr>
<tr>
<td>Groundnut</td>
<td>60.0</td>
<td>11.34</td>
</tr>
<tr>
<td>Kuri</td>
<td>28.0</td>
<td>5.29</td>
</tr>
<tr>
<td>Bavto</td>
<td>13.0</td>
<td>2.44</td>
</tr>
<tr>
<td>Samel</td>
<td>12.0</td>
<td>2.26</td>
</tr>
<tr>
<td>Sesam</td>
<td>10.0</td>
<td>1.90</td>
</tr>
<tr>
<td>Hemp</td>
<td>3.7</td>
<td>0.75</td>
</tr>
<tr>
<td>Tur (arhar)</td>
<td>2.4</td>
<td>0.56</td>
</tr>
<tr>
<td><strong>Rabi Crops</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gram</td>
<td>177.5</td>
<td>33.66</td>
</tr>
<tr>
<td>Wheat</td>
<td>77.4</td>
<td>14.55</td>
</tr>
</tbody>
</table>
Fig. 40 and 41 show the use of land in the kharif and rabi seasons respectively. Rice, maize and groundnut are the kharif crops, while gram and wheat are the main rabi crops. Double cropping is carried on with the help of irrigation. Wheat is entirely an irrigated crop whereas a few gram fields are irrigated. The Wheat-gram mixture is not practised. This is mainly due to the fact that in double-cropped fields, under assured conditions of water-supply, a pure wheat crop is economically more profitable than wheat-gram mixture.

VILLAGE ANDHARI

This village is situated about 3 km. south-east of Limkheda railway station (Fig. 42). It has the characteristics of the Maize-gram Rice Sub-Region.

The village fields have been mapped and classified on the basis of fertility and productivity (Fig. 43).

The soil of good quality land 'A' is mainly loam, well drained and is irrigated from wells. These lands are double-cropped. The land is mostly utilized for the cultivation of rice during kharif season and a leguminous crop like gram in the rabi season.

The soil of the medium quality land 'B' is sandy and less productive than 'A'. It is brownish in colour. The lighter patches of land are left fallow. The main crop is maize and the others are groundnut, kodra etc. in the kharif season. No rabi crop can be taken from these lands.
CENTRAL GUJARAT
VILLAGE STUDIES-III

LOCATION OF THE VILLAGE ANDHARI

SOURCE:
SURVEY OF INDIA MAPS No.46(F, 13/1)
THE OUTLINE OF ANDHARI HAS BEEN DRAWN BY THE WRITER.
The poor quality land 'C' are those which are not utilized for crops because they are under forest.

Irrigation:

23 per cent of lands are irrigated by wells only in the rabi season. (Fig.44).

Land Utilization:

Table LXXI shows the use of land in the year 1961-62.

<table>
<thead>
<tr>
<th>Use of land</th>
<th>Area in acres</th>
<th>Percentage of the total area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net sown area</td>
<td>516.20</td>
<td>39.19</td>
</tr>
<tr>
<td>Fallow land</td>
<td>58.50</td>
<td>4.41</td>
</tr>
<tr>
<td>Forest</td>
<td>726.70</td>
<td>55.33</td>
</tr>
<tr>
<td>Land not available for cultivation</td>
<td>11.60</td>
<td>1.00</td>
</tr>
<tr>
<td>Other uncultivated land</td>
<td>1.00</td>
<td>0.07</td>
</tr>
<tr>
<td>Total kharif areas</td>
<td>516.20</td>
<td></td>
</tr>
<tr>
<td>Total rabi area</td>
<td>119.00</td>
<td>about 23 per cent of net sown area</td>
</tr>
</tbody>
</table>
More than half the village land is under forest. The percentage of fallow land is low and the percentage of land not available for cultivation includes settlements, wells, cart tract etc., and the percentage of other uncultivated land, which is utilized for village school and cemetery is negligible.

The rabi area is approximately one fourth of the kharif area.

Table LXXII shows the area under kharif and rabi crops:

<table>
<thead>
<tr>
<th>Crops</th>
<th>Area in acres</th>
<th>Percentage of net sown area</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>KHARIF CROPS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maize</td>
<td>197.0</td>
<td>38.14</td>
</tr>
<tr>
<td>Rice</td>
<td>168.0</td>
<td>32.51</td>
</tr>
<tr>
<td>Groundnut</td>
<td>87.2</td>
<td>16.84</td>
</tr>
<tr>
<td>Kodra</td>
<td>38.0</td>
<td>7.32</td>
</tr>
<tr>
<td>Hemp (Bombay)</td>
<td>12.0</td>
<td>2.50</td>
</tr>
<tr>
<td>Fodder (Grass)</td>
<td>7.0</td>
<td>1.54</td>
</tr>
<tr>
<td>Samel</td>
<td>5.0</td>
<td>0.98</td>
</tr>
<tr>
<td>Chillies</td>
<td>2.0</td>
<td>0.37</td>
</tr>
<tr>
<td><strong>RABI CROPS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gram</td>
<td>119.0</td>
<td>23.0</td>
</tr>
</tbody>
</table>
Fig. 45 shows the use of land during kharif and rabi seasons. Andhari being a forested village, the fields are rather scattered. One main block of fields growing different crops is on the west. Other fields are located in the south and northeast of the village. In the Hadhaph loop, groundnut kodra, rice etc., are grown. The maize fields are located as near to the settlement as possible to prevent theft of the bhutta (in Gujarati it is known as Makai-na-Lunda).

Most of the rice fields are double cropped, yielding gram in rabi season. The map shows conspicuous bold vertical lines and fine dots, thereby, indicating that the area is double cropped.

III. BARODA SAVLI

Baroda Savli region is located in the northwestern and western part of Baroda district and occupies about 1,420 sq.km in area.

Relief Features:

The Savli is bordered on the west by Mahi river and on the east by the rivers of Megri, Goma, and Karad which are the tributaries of Mahi. The area is a level plain and slopes to the west.

In the valleys, the soil is often black and sticky, but in the open fields the soil is rich loam which is very fertile for tobacco—the cash crop of the area. Towards the east, soils are coarse, and shallow and of granitic origin.


Distribution of Crops:

The percentage of double-cropped area to net sown area is about 9.0 in Baroda and 8.70 in Savli. The double cropping is carried out mainly without the help of irrigation. The crops in both seasons depend mainly on rainfall (Baroda annual rainfall 816 mm; Savli 1,000 mm). The yield of rabi crop is however, very low, unless fertilizers are used to replenish the lost nutrient of the soil. For instance, the yield of transplanted paddy may be 30 times the seed rate, but that of wheat (even with the fertilizers) is only 15 times. This is because of the fact that there is little rainfall in winter and in the absence of irrigation facilities the yield of wheat is poor.

The most important irrigation tanks in this region are Muval, Dhanora, Wordala, Karchia, Jawala and Harigar. These tanks are in the Savli taluka. Except for one or two, all the other tanks dry up in late winter and early summer. However, a number of small irrigation works in the form of ani culi are being constructed under the auspices of the taluka Development Blocks.

The principal kharif crop of Baroda-Savli Region is cotton while the main rabi crops are tobacco and Jowar. The percentage of these and other crops to net sown area are given in Table LXXIII.

---

Cotton and tobacco are the most important cash crops of this region. Apart from the above mentioned crops, two other crops namely, groundnut and bajri are grown along the banks of rivers. The two talukas account for about 14,300 acres.

As one proceeds to the east of the Baroda Savli Region, rice and groundnut become more important as the soil tends to sandy clay with the result that the pattern of crop changes. Cotton declines in importance and groundnut becomes more significant. The other crops of the Baroda Savli Region are kodra, and tur (arhar) in the kharif season and wheat during the rabi season.

The author has selected the village Sardarpura for a detailed study of the land use patterns.
VILLAGEl SARDARPURA

The village Sardarpura is situated about 5 km. west of Savli town of the Baroda District (Fig. 46).

On the basis of fertility and productivity the lands of Sardarpura have been mapped and classified. (Fig. 47).

Good quality land 'A' has only a very limited area which is utilized for rice and tur in kharif season. The soil available is clayey loam.

The soil of the medium quality land 'B' is sandy loam, extremely suited for a variety of crops, particularly tobacco. The other crops are groundnut, kodra, cotton, tur etc.,

'C' the poor quality land is very sandy and is utilized for bajri cultivation.

The soils of the village are not irrigated.

Table LXXIV shows the land utilization of the village Sardarpura for the year 1961-62.
**CENTRAL GUJARAT**

**VILLAGE STUDIES—IV**

**LOCATION OF THE VILLAGE SARDARPURA**

The outline of Sardarpura has been drawn by the writer.

**SETTLEMENTS**

**Source:**

Survey of India Map No. 46

**Unmetalled Road**

**CART TRACT**

**RAILWAY**

**WASTE LAND**

**TANK WITH EMBANKMENT**

**GROVE**

**TRIG STATION WITH HEIGHT IN METRES**

Fig. 46
SARDARPURA
LAND CLASSIFICATION

A - GOOD QUALITY LAND
B - MEDIUM QUALITY LAND
C - POOR QUALITY LAND
G - GRAZING LAND
R - RAVINE (KOTAR)
S - SETTLEMENTS
V - VILLAGE ROAD
G - GROVE
O - WELL
T - TANK

SOURCE: BASED ON AUTHOR'S FIELD WORK.

Fig. 47
**TABLE LXXIV**

<table>
<thead>
<tr>
<th>Use of land</th>
<th>Area in acres</th>
<th>Percentage of total area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net sown area</td>
<td>206.2</td>
<td>90.30</td>
</tr>
<tr>
<td>Fallow land</td>
<td>...</td>
<td></td>
</tr>
<tr>
<td>Forest</td>
<td>...</td>
<td></td>
</tr>
<tr>
<td>Land not available for</td>
<td>8.8</td>
<td>3.96</td>
</tr>
<tr>
<td>cultivation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other uncultivated land</td>
<td>12.8</td>
<td>5.74</td>
</tr>
<tr>
<td>Double-Cropped land</td>
<td>2.8</td>
<td>1.30</td>
</tr>
<tr>
<td>Irrigated land</td>
<td>...</td>
<td></td>
</tr>
</tbody>
</table>

It will be seen from this table that there is no fallow land in this village. This Baroda Savli Region therefore, compares favourably with the Padra Kanham, in this respect. The percentage of net sown area to total area is very much higher in this village than that of the village Kalian, considered earlier. The reason for this difference is to be traced mainly in the relief of the two regions Kalian village belong to a region which is larger hilly and forested, while Sardarpura village lies in Baroda Savli which is a dead flat, plain region. Further, Andhari village belongs to a region where the forest cover on one hand restricts the availability of cultivable land but on the other hand provides wood for fuel; in the Sardarpura village, owing to the absence of forest cover, the villagers are led to use cow-dung as fuel instead of using it as manure.
The land utilization pattern of 1961-62 is shown in Table LXXV. The use of land is mapped in Fig.48.

**TABLE LXXV**

<table>
<thead>
<tr>
<th>Crops</th>
<th>area in acres</th>
<th>Percentage of net sown area</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Kharif Crops</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tobacco</td>
<td>61.5</td>
<td>30.00</td>
</tr>
<tr>
<td>Groundnut</td>
<td>41.3</td>
<td>19.95</td>
</tr>
<tr>
<td>Bajri</td>
<td>32.2</td>
<td>15.53</td>
</tr>
<tr>
<td>Kodra</td>
<td>23.8</td>
<td>11.65</td>
</tr>
<tr>
<td>Sundhia (Fodder)</td>
<td>15.9</td>
<td>7.76</td>
</tr>
<tr>
<td>Tur (Arhar)</td>
<td>11.2</td>
<td>5.34</td>
</tr>
<tr>
<td>Rice</td>
<td>14.0</td>
<td>6.80</td>
</tr>
<tr>
<td>Cotton</td>
<td>4.2</td>
<td>1.97</td>
</tr>
<tr>
<td>Bavto</td>
<td>1.1</td>
<td>0.50</td>
</tr>
<tr>
<td>Gaur</td>
<td>1.0</td>
<td>0.50</td>
</tr>
<tr>
<td><strong>Rabi Crops</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Castor</td>
<td>1.6</td>
<td>0.80 of N.S.A.</td>
</tr>
<tr>
<td>Math</td>
<td>1.2</td>
<td>0.50</td>
</tr>
</tbody>
</table>
It will be seen from Table LXXV that Sardarpura village cannot be classified as a double-cropped village. Math and Castor, which are the rabi crops constitute 1.30 per cent of the net sown area. This contrasts well with the Kalian village of the 'Double-Cropped Irrigated Region' where gram, a rabi crop, constitute more than 33 per cent of the net sown area.

Fig.48 shows the pattern of land use in the kharif and rabi seasons of the village Sardarpura. The map reveals that castor is grown in some of the kodra fields. Such double cropping is possible without irrigation, owing to adequate rainfall. But it does not ensure a good rabi harvest. When the rain fails or ceases earlier, usual, the wheat as a second rabi crop is almost lost.

In some of the double-cropped kodra fields, the rabi crop, math is taken. The cultivator usually divides the field into three sections. The portion of the field, which is most productive is devoted to wheat, while the less productive one is given to math. Math, being a leguminous crop raises the fertility of the land on the one hand and on the other hand it also provides the farmer with vegetable protein. This is an important food stuff to the people who are non-vegetarian. In the third section of the field the farmer would grow castor, which would bring him some oil.

The fields growing groundnut and sundhia (fodder) are never double-cropped, because these two crops are grown only on very poor lands which can hardly support two crops in a year.
SARDARPURA
LAND UTILIZATION.
1961-1962
FIELD PATTERNS

Kharif Crops
- Tobacco
- Groundnut
- Bajri
- Kodra
- Sundhia (fodder)

Rabi Crops
- Rice
- Tur (Arhar)
- Cotton
- Bawte
- Guar
- Castor

Land not available for cultivation

Settlements
- Village road
- Well
- Tank
- Ravine (Kotar)

Other uncultivated land
- Grazing land

Total area (27.2 acres)
Total kharif area (206.2 acres)
Total rabi area (2.8 acres)

Source: Based on author's field work.

Fig. 48
These fields owing to poverty of soil are single cropped fields.

The fields that lie to the village settlements are benefitted by the village refuse and are most productive. These fields are invariably devoted to tobacco which is an exhausting crop and brings adequate remunerative return to the farmers.

IV THE 'MEDIUM BLACK' SOIL TRACT

The medium black soil tract, named after the prevailing soils, extends over the major portion of the Baroda district, except the two Regions (Kanham and Baroda-Savli), described earlier, covers the Lunawada taluka, the western part of the Santrampur taluka, the northern part of the Godhra taluka, the eastern part of the Halol taluka and the Jamburg taluka of the Panchmahals district. The most typical talukas of this tract are Lunawada, Jamburg, Sankheda and Chhota Udepur. These will, therefore, be used as examples for purposes of statistics.

Characteristics:

The tract in question is a flat plain with slight rolling topography towards northeast of Lunawada, in Sankheda and southeast of Chhota Udepur taluka, the relief features of which have been fully described in the second chapter. The most important characteristics of this tract, from the agricultural point of view, may be summarised as follows:
On the whole these tract are fertile but around hilly areas the land is poor. In many places, especially while going from Lunawada to Santrampur, one could notice bare, hard rocks. On slopes, there occur patches of brown soils, with a large admixture of stones. In the tract, north of the river Mahi, the preponderance of stones makes the soils unsuitable for crops like rice and cotton. This characteristic underlines almost every other aspect of the natural and cultural environment. The land is so poor that, in Jher, Korvai, Borvai, Pratapur, Dolatpura, the revenue per acre is only thirty paise.

It must, however, be mentioned that within this medium black soil tract there are very fertile lands, where the accumulation of good soils has enabled the people to grow locally cash crops. The areas around Lunawada Dabhoi, Sankheda and Jabugam are the examples.

Sub-divisions of the 'Medium Black Soil Tract'

Within the Medium Black Soil Tract there are local differences in crops grown and in irrigation, on the basis of which, it could be divided into three Sub-Regions viz:

(a) The Northern Rice-Maize-Groundnut Sub-Region.
(b) The Southern Sub-Region.
(c) The Eastern Rice-Groundnut-Cotton Sub-Region.

Fig. 33 shows the above mentioned sub-regions in the Medium Black Soil Tract.
(a) The Northern Rice-Maize-Groundnut Sub-Region:

The Lunawada, western Santrampur and the eastern and southern part of Devgadh Baria taluka of the Panchmahals district, belong to this Sub-Region. In the whole Medium Black Soil tract, Lunawada taluka which is lacking in rainfall, has an appreciable acreage under irrigation. In fact, the percentage for Dabhoi taluka is highest in the whole of this tract. The irrigation water comes from wells and canals.

This sub-region, in the drainage basin of the Mahi, is a level plain, with altitudes less than 230 metres above sea level. To the south, elevations of the Devgadh Baria hills increase rapidly, while to the east rises the Dohad Range separating this region from the 'Double-Cropped Irrigated Region'.

The author has selected the village Chaoria for a detailed study of the land-use patterns of this Sub-Region.

VILLAGE CHAORIA

This village, 4 km. from Lunawada is situated on either side of the main road going from Lunawada to Santrampur(Fig.49). This village has all the characteristics typical of the northern rice-maize-groundnut sub-regions.
CENTRAL GUJARAT
VILLAGE STUDIES V
LOCATION OF THE VILLAGE CHAORIA

LOCATION OF THE VILLAGE CHAORIA

SOURCE:
SURVEY OF INDIA MAP No 46 E 12
THE OUTLINE OF CHAORIA HAS BEEN DRAWN BY THE WRITER.

Fig. 49
Fig. 50 shows the village fields divided according to their fertility and productivity. It should be mentioned, however, that no quantitative assessment of fertility can be given, but in the course of his field work of the writer visited this village and collected information on soil characteristics, on the availability of irrigation water and on the supply of manures to the crops grown in each field. On the basis of this enquiry the village land has been classified into three categories: Good quality land 'A' which is mainly medium black soil, is capable of kharif and rabi crops. 'B' medium quality land is sandy and less productive and the soil colour is slightly blackish. 'C' poor quality land which is south of the main road and is largely comprises reserve forests. Certain portions are utilized for growing fodder (grass) and for grazing the village cattle.

Irrigation:

9.81 per cent of the net sown area is irrigated for rabi crops only. All kharif crops in this Chaoria village are unirrigated. Irrigation is done by wells and Fig. 51 shows the location of the fields which are irrigated.
Fig. 50

CHAOORIA
LAND CLASSIFICATION
1961-1962

A - GOOD QUALITY LAND
B - MEDIUM QUALITY LAND
C - POOR QUALITY LAND
V - VILLAGE SITE
T - TANK
V - VILLAGE ROAD
W - WELL
F - FOOTPATH

SOURCE:
BASED ON AUTHOR'S FIELD WORK
SOURCE: BASED ON AUTHOR'S FIELD WORK.

CHAORIA
IRRIGATION
1961-1962

IRRIGATED IN RABI
UNIRRIGATED
WELL
VILLAGE SITE
CURRENT FALLOW
VILLAGE ROAD
GRAZING LAND

Fig.51
Land Utilization:

Table LXXVI shows the use of land in the year 1961-62.

<table>
<thead>
<tr>
<th>Use of land</th>
<th>area in acres</th>
<th>Percentage of the total area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net sown area</td>
<td>428.3</td>
<td>71.10</td>
</tr>
<tr>
<td>Fallow land</td>
<td>38.3</td>
<td>6.71</td>
</tr>
<tr>
<td>Forest</td>
<td>75.2</td>
<td>13.20</td>
</tr>
<tr>
<td>Land not available for cultivation</td>
<td>33.5</td>
<td>5.74</td>
</tr>
<tr>
<td>Other uncultivated land</td>
<td>17.7</td>
<td>3.25</td>
</tr>
<tr>
<td>Double-cropped land</td>
<td>16.0</td>
<td>14.61 of N.S.A.</td>
</tr>
<tr>
<td>Irrigated land</td>
<td>42.0</td>
<td>9.81 of N.S.A.</td>
</tr>
<tr>
<td>Total kharif area</td>
<td>428.3</td>
<td></td>
</tr>
<tr>
<td>Total rabi area</td>
<td>60.0</td>
<td>about 1/7 of the kharif area.</td>
</tr>
</tbody>
</table>

Table LXXVI shows that there is a high percentage of cultivated land in the village. There is a small proportion of the land that is kept fallow. There is however, a small percentage of the land that is "not available for cultivation, as it consists mostly of built up areas, while other small part is left for tanks, roads etc.
Because of irrigation facilities farmers are in a position to cultivate wheat and math crops in some of the fields during rabi season (Fig. 5.3).

Table LXXVII shows the use of land in the kharif and rabi seasons:

<table>
<thead>
<tr>
<th>Crops</th>
<th>Area in acres</th>
<th>Percentage of net sown area</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>KHARIF CROPS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rice</td>
<td>137.0</td>
<td>30.10</td>
</tr>
<tr>
<td>Maize</td>
<td>80.0</td>
<td>18.70</td>
</tr>
<tr>
<td>Groundnut</td>
<td>66.3</td>
<td>15.50</td>
</tr>
<tr>
<td>Bajri</td>
<td>55.0</td>
<td>12.95</td>
</tr>
<tr>
<td>Bavto</td>
<td>35.0</td>
<td>8.20</td>
</tr>
<tr>
<td>Cotton</td>
<td>16.0</td>
<td>3.50</td>
</tr>
<tr>
<td>Jowar</td>
<td>14.0</td>
<td>3.10</td>
</tr>
<tr>
<td>Tur (arhar)</td>
<td>10.0</td>
<td>2.40</td>
</tr>
<tr>
<td>Grass (Fodder)</td>
<td>9.0</td>
<td>2.10</td>
</tr>
<tr>
<td>Sesame</td>
<td>5.0</td>
<td>1.20</td>
</tr>
<tr>
<td>Vegetables</td>
<td>1.0</td>
<td>0.25</td>
</tr>
<tr>
<td><strong>RABI CROPS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Math</td>
<td>20.5</td>
<td>4.85</td>
</tr>
<tr>
<td>Wheat</td>
<td>20.4</td>
<td>4.73</td>
</tr>
<tr>
<td>Gram</td>
<td>19.1</td>
<td>4.43</td>
</tr>
</tbody>
</table>
CHAORIA
RABI CROPS
1961-1962

SOURCE: BASED ON AUTHOR'S FIELD WORK.

Fig. 53
Some of the fields are double-cropped as they are occupied by wheat and gram in the rabi season. Math is also grown in this rabi season in the paddy fields. Math and wheat are grown with the help of irrigation.

Fodder is grown close to the village site. Tur (arhar) is grown with rice but this practice is observed in limited fields. There is very small percentage of land which is devoted to vegetables.

(b) THE SOUTHERN SUB-REGION:

The southern cotton-Rice-Jowar Sub-Region is represented by Jabugam, Jambughoda, Sankheda, Tilakwada, Sinor, southeastern part of Halol, north and southeastern part of Dabhoi and southern parts of Waghodia talukas. Cotton, rice and jowar are the most important crops; and irrigation is negligible. In Pansoli village, for instance, rice and cotton together occupy nearly 60 per cent of the net sown area and only two acres of land is irrigated. But along the side of the Wadhwan canal, in the Dabhoi taluka, irrigated rice becomes an important kharif crop and some of the rice fields are capable of growing irrigated wheat (locally known as 'Piet' wheat) in winter season.

The main differences between this region and Northern Sub-Region are: (1) This area for a long time growing cotton. As a cotton producing area, it ranks second in Central Gujarat. It is only recently that, with the rise in paddy prices, that paddy has been introduced. Under the
guidence of the Taluka Development Officers the fields are being gradually bunded. (2) The soil in this region is heavier as compared to that of the northern region and responds more favourably to the cultivation of cotton.

The representative village for the Southern Sub-Region, for a detailed study, is Timbi.

VILLAGE TIMBI

Timbi is situated about 3 km. northeast of Dabhoi town, (Fig. 54). The village has been selected by the writer for an intensive study of the land use patterns in detail. In the study of this village the writer has taken note of the recent developments. It is a very prosperous village because of facilities of canal irrigation.

The soil map (Fig. 55) classifies the village fields according to their fertility and productivity. 90 per cent of the Timbi's land categories as a good quality land and is depicted by 'A' on the map. 'B' medium and 'C' poor quality lands are concentrated towards northeast of the village. These lands are being utilized either as grazing lands or for growing grass (fodder) in the monsoon season. At some places the land is salty.

Irrigation: (Fig. 54)

Irrigation is done by canals. The rice (Pankhari) quality) fields near to the canal are irrigated. The other crops that is irrigated is wheat.

* Irrigated rice.
CENTRAL GUJARAT
VILLAGE STUDIES — VI
LOCATION OF THE VILLAGE TIMBI

FROM PRATAP N. (BARODA)
FROM MIYA-GAM

SETTLEMENTS
SEASONAL CHANNEL
METALLED ROAD
UNMETALLED ROAD
CART-TRACT
FOOT-PATH
RAILWAY
GROVE
WASTE LAND

SOURCE:
SURVEY OF INDIA MAP No. 46 F 4 & 8
THE OUTLINE OF TIMBI HAS BEEN DRAWN
BY THE WRITER.

Fig. 54
TIMBI
LAND CLASSIFICATION
1961-1962

A — GOOD QUALITY LAND
B — MEDIUM QUALITY LAND
C — POOR QUALITY LAND
TANK
VILLAGE SITE
WELL
VILLAGE ROAD
(Unmetalled)

SOURCE:
BASED ON AUTHOR'S FIELD WORK

Fig. 55
TIMBI
IRRIGATION
1961-1962

SOURCE:
BASED ON AUTHOR'S FIELD WORK.

Fig. 56
Land Utilization:

Table LXXVIII gives a summary of the proportion of the village lands devoted to various uses in 1961-62.

<table>
<thead>
<tr>
<th>Use of land</th>
<th>Area in acres</th>
<th>Percentage of the total area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net sown area</td>
<td>526.1</td>
<td>87.30</td>
</tr>
<tr>
<td>Fallow land</td>
<td>18.4</td>
<td>3.08</td>
</tr>
<tr>
<td>Forest</td>
<td>...</td>
<td></td>
</tr>
<tr>
<td>Land available for cultivation</td>
<td>29.4</td>
<td>5.00</td>
</tr>
<tr>
<td>Other uncultivated land</td>
<td>28.7</td>
<td>4.62</td>
</tr>
<tr>
<td>Double cropped land</td>
<td>319.0</td>
<td>79.66 of N.S.A.</td>
</tr>
<tr>
<td>Irrigated land</td>
<td>304.0</td>
<td>69.20 of N.S.A.</td>
</tr>
<tr>
<td>Total kharif area</td>
<td>526.1</td>
<td></td>
</tr>
<tr>
<td>Total rabi area</td>
<td>209.5</td>
<td>2/5 of the kharif area</td>
</tr>
</tbody>
</table>

Table LXXVIII shows that there is a high percentage of land which is devoted to rabi crops. This, of course, is the most important characteristic of this agricultural region. This is made possible by the availability of irrigation water, so that more than a half of the net sown area is
irrigated by Wadhwan canals. Though there is predominance of kharif crops, rabi crop is equally important, and hence the farmers are busy throughout the year. Fallow land and land not available for cultivation are insignificant.

Table LXXIX gives a summary of the proportions of the village lands devoted to various crops.

**TABLE LXXIX**

<table>
<thead>
<tr>
<th>Crops</th>
<th>area in acres</th>
<th>Percentage of net sown area</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>KHARIF CROPS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rice</td>
<td>326.1</td>
<td>61.00</td>
</tr>
<tr>
<td>Cotton</td>
<td>86.2</td>
<td>16.35</td>
</tr>
<tr>
<td>Fodder</td>
<td>57.1</td>
<td>10.90</td>
</tr>
<tr>
<td>Vegetables</td>
<td>56.7</td>
<td>10.79</td>
</tr>
<tr>
<td><strong>RABI CROPS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wheat</td>
<td>118.6</td>
<td>22.52</td>
</tr>
<tr>
<td>Vegetables</td>
<td>54.7</td>
<td>20.44</td>
</tr>
<tr>
<td>Gram</td>
<td>18.1</td>
<td>3.43</td>
</tr>
<tr>
<td>Val</td>
<td>18.1</td>
<td>3.43</td>
</tr>
</tbody>
</table>
A study of Fig. 57 shows most notably the double-cropping of fields, with paddy in the rainy season and wheat gram and val in winter. This double cropping is made possible by irrigation; and it may be noticed that where the canals are accessible, double-cropping is almost invariably done. The gram fields are not irrigated, and they are entirely dependent on the moisture retained in the soil.

An important crop near the village site is vegetables. These are grown in small plots close to the actual site, where the soil is relatively more productive and where the farmers can pay sufficient attention to the crops. The location of this village close to the Dabhoi town has further helped the villagers in marketing the vegetables. The vegetables which are sold in the town bring some cash to the farmers.

(c) THE EASTERN RICE-GROUNDNUT-COTTON SUB REGION:

In the Eastern Rice-Groundnut-Cotton Sub Region cotton is still important but rice assumes first place, mainly because of the soils. In Chhota Udepur taluka, for example, rice occupies 20.80 per cent of the net sown area, while cotton is 16.37 per cent of the net sown area. In part of this Sub-Region, groundnut is also important.

The village Amalwant, a Bhil village, situated about 3 km. west of Kawant town (Fig. 58) has been chosen by the author to represent the Eastern Rice-Ground-Cotton Sub-Region.
LOCATION OF THE VILLAGE AMALWANT

CENTRAL GUJARAT
VILLAGE STUDIES—VII

SETTLEMENTS
SEASONAL CHANNEL
TRIGL. STATION WITH HEIGHT IN METRES

METALLED ROAD
UNMETALLED ROAD
CART TRACT

SOURCE:
SURVEY OF INDIA MAP NO. 46 1/4

THE OUTLINE OF AMALWANT HAS BEEN DRAWN BY THE WRITER.

Fig. 58
In Fig. 59, an attempt has been made to classify the soil of the village according to their productivity and fertility.

The good quality land 'A' and poor quality land 'C' covers almost an equal area. The medium quality is denoted by 'B'.

The soil is essentially medium black clay. Rice and cotton are the main crops for good quality land, while on the medium quality land, groundnut, maize, tur, jowar etc., are grown.

The poor quality land, situated south of the village settlements, is stony and hence, is utilized for grazing purposes. Patches of medium quality land within this area are cultivated.

Irrigation is not practised in this sub-region.

Land Utilization:

Table LXXX shows the use of land in the year 1961-62.

<table>
<thead>
<tr>
<th>Use of land</th>
<th>Area in acres</th>
<th>Percentage of the total area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Sown area</td>
<td>423.3</td>
<td>72.77</td>
</tr>
<tr>
<td>Fallow Land</td>
<td>15.7</td>
<td>2.71</td>
</tr>
<tr>
<td>Forest</td>
<td>12.3</td>
<td>2.11</td>
</tr>
<tr>
<td>Land not available for cultivation</td>
<td>14.0</td>
<td>2.41</td>
</tr>
<tr>
<td>Other Uncultivated land</td>
<td>11.5</td>
<td>2.00</td>
</tr>
<tr>
<td>Double Cropped Land</td>
<td>40.7</td>
<td>9.68</td>
</tr>
<tr>
<td>Total Kharif area</td>
<td>423.3</td>
<td></td>
</tr>
<tr>
<td>Total Rabi area</td>
<td>20.4</td>
<td>about 1/20 of the kharif area</td>
</tr>
</tbody>
</table>
It will be seen from Table LXXX that there is a high percentage of cultivated land. A very small percentage of the land is kept fallow.

There is a small percentage of double-cropped land and this is mainly because of lack of irrigation facilities in the village.

The land utilization pattern for 1961-62 is given in Table LXXXI.

<table>
<thead>
<tr>
<th>Crops</th>
<th>Area in acres</th>
<th>Percentage of net sown area</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>KHARIF CROPS:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rice</td>
<td>130.7</td>
<td>30.94</td>
</tr>
<tr>
<td>Cotton</td>
<td>110.5</td>
<td>26.13</td>
</tr>
<tr>
<td>Groundnut</td>
<td>92.5</td>
<td>21.89</td>
</tr>
<tr>
<td>Grass (Fodder)</td>
<td>20.5</td>
<td>4.85</td>
</tr>
<tr>
<td>Maize</td>
<td>20.3</td>
<td>4.80</td>
</tr>
<tr>
<td>Tur (arhar)</td>
<td>20.2</td>
<td>4.78</td>
</tr>
<tr>
<td>Jowar</td>
<td>19.0</td>
<td>4.49</td>
</tr>
<tr>
<td>Samel</td>
<td>5.3</td>
<td>1.28</td>
</tr>
<tr>
<td>Vegetables</td>
<td>2.3</td>
<td>0.57</td>
</tr>
<tr>
<td>San (Bombay Hemp)</td>
<td>2.0</td>
<td>0.27</td>
</tr>
<tr>
<td><strong>RABI SEASON:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black gram (Urd)</td>
<td>14.6</td>
<td>3.43</td>
</tr>
<tr>
<td>Wheat</td>
<td>2.4</td>
<td>0.59</td>
</tr>
<tr>
<td>Castor</td>
<td>2.0</td>
<td>0.47</td>
</tr>
<tr>
<td>Math</td>
<td>1.5</td>
<td>0.35</td>
</tr>
</tbody>
</table>
The above data is cartographically represented in Fig.60. It is evident that rice, cotton, and groundnut are the principal kharif crops, while other crops like fodder, maize, tur, jowar, etc., are also grown in kharif season.

V. THE HALOL GODHRA PLAIN

Location and surface features:

The Halol Godhra Plain is the part of an alluvial plain formed by tributaries of the river Mahi. The plain has provided level space for larger settlements in the area, which includes the entire Chikni and Madia basins and the upper basins of the Masri, Goma, Karad, Vishwamtri and Dhadhar. The plain roughly lies between 76 and 152 metre contour lines and tapers towards southwest. The Halol Godhra Plain includes parts of the Waghdia, Halol Devgadh Baria, Kalol, Godhra and Seshra talukas.

The Halol Godhra plain differs from the 'Double-Cropped-Irrigated Region', in respect of height, slopes and cultural features. It is much lower, Godhra being 82 metres above sea level (Dohad 333 metres). The area does not show undulations as are found in the 'Double-Cropped-Region. In the south, the levelness is broken by the volcanic Pavagadh hill rising 823 metres above country level.

Distribution of Crops

The Godhra and Kalol talukas have the largest proportion of the land under crops in the whole of the Panchmahals district, the percentage figure of the net sown area to the total area being 61.92 and 69.82 respectively.
The Halol Godhra plain cannot be called a double cropped tract, because rice, groundnut, maize and cotton are grown in the rainy season and a negligible percentage of wheat and gram in winter. The percentages of these crops to net area sown are as follows:

<table>
<thead>
<tr>
<th>Taluka</th>
<th>Rice</th>
<th>Groundnut</th>
<th>Maize</th>
<th>Cotton</th>
<th>Wheat</th>
<th>Gram</th>
</tr>
</thead>
<tbody>
<tr>
<td>Godhra</td>
<td>28.60</td>
<td>16.68</td>
<td>17.07</td>
<td>8.89</td>
<td>2.21</td>
<td>3.97</td>
</tr>
<tr>
<td>Kalol</td>
<td>25.63</td>
<td>36.31</td>
<td>1.33</td>
<td>9.79</td>
<td>1.91</td>
<td>1.11</td>
</tr>
</tbody>
</table>

Actually, rice and cotton are grown in the more fertile areas, while on sloping lands and wherever the land is stony and infertile groundnut and maize are grown. Groundnut is grown as a commercial crop as elsewhere in the Panchmahals district, often in rotation with cotton.

3.47 per cent and 2.75 per cent of the net sown area is irrigated in Godhra and Kalol taluka respectively. Mostly the irrigation is made by wells. In these talukas, there were, in 1961-62, 8,445 wells (kachcha and Pucca). Tube wells are now being erected by the taluka Development Officers and sites are also being chosen for the construction of regulators. The Government also give taccavi loan for the construction of wells.
The soil of Halol Godhra Plain are naturally productive and the progressive Kolies obtain fairly high yields from the land. According to the Gram Sevak of Jafrabad, the yield of paddy (in that village) is 1,120 to 1,280 lbs., per acre, while at Chikodra, another village, the Gram Sevak claims a yield of 1,600 lbs. per acre. The yield of wheat is much lower, being 800 to 960 lbs. or even less per acre. Actually, this tract is a kharif tract, and it is possible to obtain greater yields of rice-groundnut. But, on account of lack of irrigation, in Kalol taluka the farmers will not take the risk, and usually sow kharif crops on the wheat fields.

Rice and maize are grown for home consumption. The Patel's and Koli's, being intelligent farmers have adopted a sort of crop rotation. While paddy is sown every year in the rainy season, wheat may be replaced, after four or five years, by gram or lentil for one year. Such occasional rotation replenishes the fertility of the soils.

The author has chosen Kadvipali to represent this region.

VILLAGE KADVIPALI

This village is located about 1 k.m. north of Gogamba on the right bank of the Karad river (Fig. 61).
CENTRAL GUJARAT
VILLAGE STUDIES—VIII
LOCATION OF THE VILLAGE KADVIPALI

SETTLEMENTS
SEASONAL CHANNEL
METALLED ROAD
CART TRACT
FOOT PATH

TANK WITH EMBANKMENT
GROVE
WASTE LAND
HEIGHTS ABOVE M.S.L. IN METRES
TRIGL STATION WITH HEIGHT IN METRES

SOURCE:
SURVEY OF INDIA MAP No. 46 F/10

THE OUTLINE OF KADVIPALI HAS BEEN DRAWN BY THE WRITER

Fig. 61
An attempt has been made in Fig. 62 to classify the village fields according to their fertility and productivity.

The good quality land 'A' is alluvium and supports the crops of rice, in kharif and wheat in rabi season. This soil is capable of retaining moisture.

The medium quality land 'B' is sandy which is very suitable for groundnut.

The poor quality land 'C' is more sandy as compared with 'B' soil and occurs in three patches, on the south of the forest towards the west of Modia Dungar (hillock) and in the southern part of the village, the land is mostly used as village commons (Gram Panchayat) and grazing purposes.

Land Utilization:

Table LXXXIII gives a summary of the proportion of the land devoted to various uses in 1961-62.

<table>
<thead>
<tr>
<th>Use of land</th>
<th>Area in acres</th>
<th>Percentage of the total area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net sown area</td>
<td>269.2</td>
<td>72.21</td>
</tr>
<tr>
<td>Fallow Land</td>
<td>7.1</td>
<td>1.20</td>
</tr>
<tr>
<td>Forest</td>
<td>...</td>
<td></td>
</tr>
<tr>
<td>Land available for cultivation</td>
<td>56.4</td>
<td>14.19</td>
</tr>
<tr>
<td>Other uncultivated land</td>
<td>46.3</td>
<td>12.30</td>
</tr>
<tr>
<td>Double cropped land</td>
<td>76.8</td>
<td>20.20 of N.S.A.</td>
</tr>
</tbody>
</table>
The Table LXXXIII shows that there is high percentage of cultivated land and the percentage of fallow land is insignificant. This is not only due to the high fertility of the land but also because of the industrious nature of the people in this village. Of necessity, certain types of land have to be left fallow for more than a year, i.e., they are all mostly old fallows. The reason why lands are left fallow has already been explained in the earlier chapter. Some of these lands have been or are being converted into cultivated lands. ¹

About one seventh of the total area is classified as 'land not available for cultivation'. This consists of cultivable wastes and permanent pastures. The latter is used for grazing and is not generally good enough to be brought under the plough. 'Culturable wastes' are those lands which remain uncultivated for more than five years; some of these areas are cultivated in four out of ten years in a long crop-rotation.

Table LXXXIV gives a summary of the proportion of the lands devoted to various crops during kharif and rabi seasons in 1961-62.

<table>
<thead>
<tr>
<th>TABLE LXXXIV</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Crops</strong></td>
</tr>
<tr>
<td>--------------</td>
</tr>
<tr>
<td><strong>KHARIF CROPS:</strong></td>
</tr>
<tr>
<td>Groundnut</td>
</tr>
<tr>
<td>Rice</td>
</tr>
<tr>
<td>Cotton</td>
</tr>
<tr>
<td>Maize</td>
</tr>
<tr>
<td>Banti</td>
</tr>
<tr>
<td>Bajri</td>
</tr>
<tr>
<td><strong>RABI CROPS:</strong></td>
</tr>
<tr>
<td>Wheat</td>
</tr>
<tr>
<td>Gram</td>
</tr>
</tbody>
</table>

¹ Please also see Chapter XIV.
It will be seen from Table LXXXIV that double cropping is slightly more important here than in the village of Kanham Region. Of the kharif crops, groundnut, rice and cotton are the important, followed by maize and banti.

Even without irrigation the villagers are able to obtain a high yield by using improved seed variety, green manure and night soil.

Of the rabi crops, wheat is the most important followed by gram.

Crop Patterns:

The field Patterns of the village Kadvipali shown in Fig.63 brings out some salient characteristics of crop patterns. In patches of land where some fertile soil has accumulated, paddy is grown. Such fields, depending on the nature of the land and the initiative of the cultivators, is double-cropped. In such double-cropped lands, wheat and gram are rabi crops. As these crops are grown close to the village site, it is easy to identify the settlements with reference to the proximity of these crops.